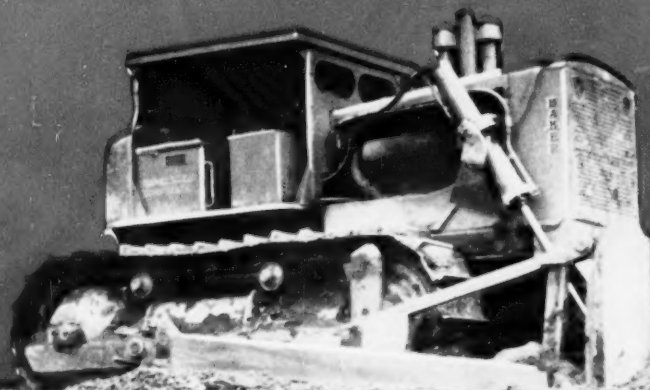


9th Annual Coal Stripping Number

COAL MINING

APRIL, 1952

VOLUME 29, No. 4



Allis-Chalmers HD-20 . . . SPRING VALLEY COAL CO., Lumber City.

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This new coal drill with its outstanding performance can cut your costs. Available for $\frac{3}{8}$ " hex or quarter-octagon collared shanks $3\frac{1}{4}$ " long. Write for full details today.

RD-43



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SALVAGING LOST COAL



● McCarthy Coal Recovery Drills put new profit in worked-out strip mines by recovering clean lump or slack coal without disturbing overburden.

The drills bore horizontally into the heart of the exposed seam to pull out continuous streams of coal from depths of 100 feet and more.

Cost of this operation varies between \$1.50 and \$2.00 per ton, including amortization of investment. A three-man crew can handle the entire job, including loading.

Rate of recovery depends entirely upon operator skill, bench width, seam thickness and diameter of auger used.

We suggest you write today to determine which of four standard models is most suitable for your requirements.

McCarthy hydraulically controlled Drills are available with 4 to 24-ft. interlocking-auger sections in 20, 24, 30, 36, 42 and 48-inch diameters. Jacks are power operated with power supplied through gasoline, diesel or electric units.

Make it a point to investigate this economical new method for recovering coal right now.

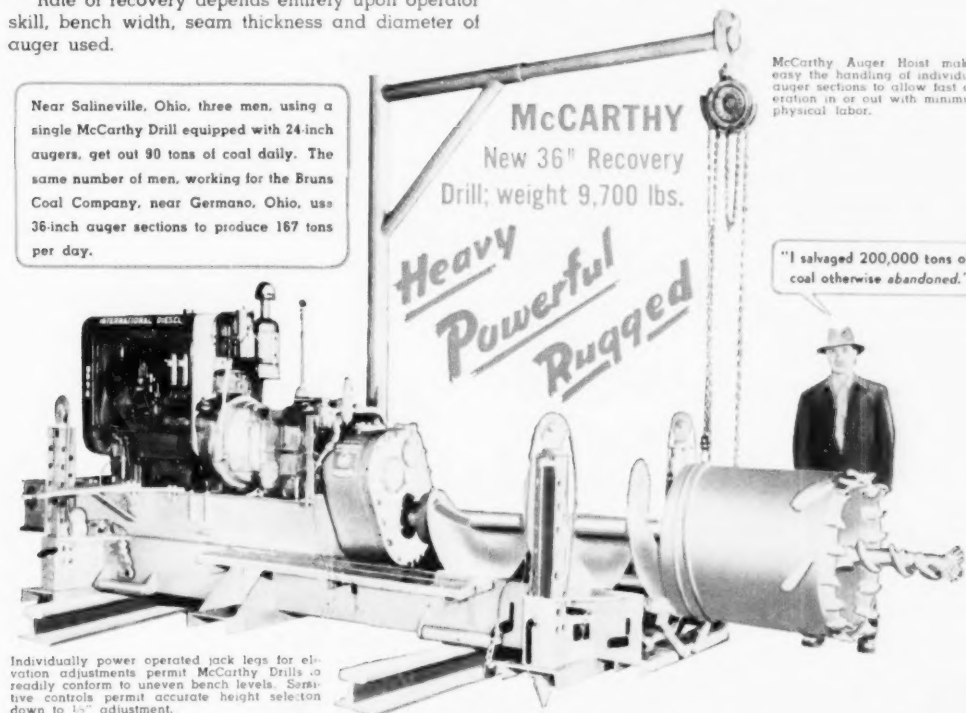
Near Salineville, Ohio, three men, using a single McCarthy Drill equipped with 24-inch augers, get out 90 tons of coal daily. The same number of men, working for the Bruns Coal Company, near Germano, Ohio, use 36-inch auger sections to produce 167 tons per day.

McCARTHY
New 36" Recovery
Drill; weight 9,700 lbs.

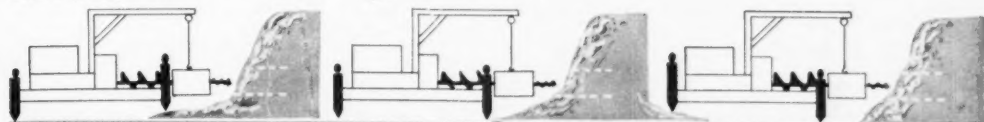
*Heavy
Powerful
Rugged*

McCarthy Auger Hoist makes easy the handling of individual auger sections to allow fast operation in or out with minimum physical labor.

"I salvaged 200,000 tons of coal otherwise abandoned."



Individually power operated jack legs for elevation adjustments permit McCarthy Drills to readily conform to uneven bench levels. Sensitive controls permit accurate height selection down to 1/2" adjustment.



THE SALEM TOOL CO.

763 SOUTH ELLSWORTH AVE. • SALEM, OHIO, U. S. A.

Published monthly by Modern Mining Publishing Company. Publication Office—Advance Printing & Litho Co., Erie, Pa. Editorial and Executive Offices—5403 Clairton Blvd., Pittsburgh 27, Pa. P. F. JASIK, Publisher & Editor. Price: In the United States, \$2.00 per year; all other countries, \$5.00. Single copy, 50 cents. Entered as second-class matter at the Post Office at Pittsburgh, Pennsylvania, under the act of March 3, 1879. Application for reentry applied for at the Post Office at Erie, Pennsylvania.

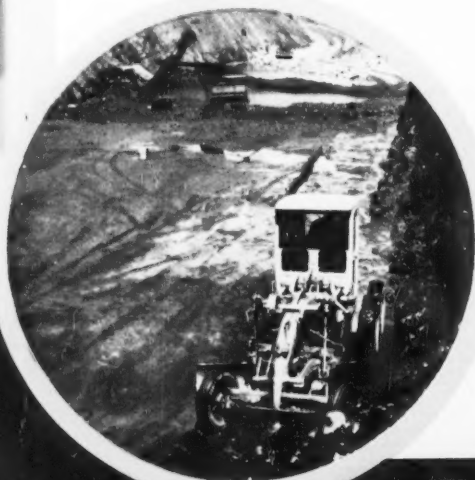
QUESTION: STRIPPERS, WHAT
WILL DO MOST T

ANSWER • • • • •



On most coal stripping operations the cost of hauling can make the difference between profit and loss. And cost of hauling depends on the condition of the hauling roads. A rutted, poorly drained, chuck-holed or boggy road surface requires more hauling units because you cannot use your hauling equipment at maximum economical speeds. Poor roads also cause high maintenance and repair expenses.

• • • • •
**A "CAT" MOTOR GRADER ON YOUR JOB
WILL**



guarantee smooth, well maintained haul roads.

increase your tonnage per hour with your present hauling equipment by permitting higher possible hauling speeds.

cut the profit-consuming costs of blown-out tires, broken springs and axles, twisted frames, and other repair items.

minimize down-time due to disabled equipment or bad weather.

do more to increase your hauling production than several new hauling units.

**AND
THAT
NOT**

ONE SINGLE NEW MACHINE TO CUT YOUR HAULING COSTS ?

A
"CAT"
MOTOR
GRADER



A "Caterpillar" Diesel No. 212 Grader with 50 h.p. engine cleans coal along high wall for Fyock & Reed on their operation near Stoystown, Pennsylvania. Metal cab and safety glass give operator protection.

THERE'S A SIZE TO FIT YOUR PARTICULAR NEEDS. EACH
IS BUILT TO GIVE MAXIMUM PERFORMANCE IN ITS HORSEPOWER RANGE.

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drive. Weight 13,670 lbs.

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Your job will move faster and your tonnage output will grow with a "Caterpillar" Diesel Motor Grader on the job. May we recommend the proper model for your operation?

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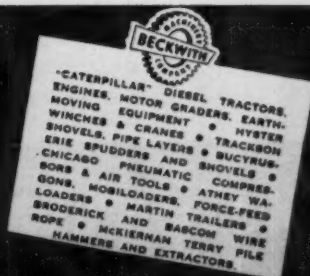
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for truck wheels, idlers, support rollers



FULL PROTECTION — only One Greasing Every 1000 Hours — with Allis-Chalmers Exclusive Positive Seal, Roller Bearing Design!

Think of it! You can operate for 6 months on a 40-hour-week basis with just one lubrication of 14 to 20 of the most-abused, hardest-to-service points on a tractor. It's possible through an exclusive combination of glass-smooth Positive Seals and anti-friction bearings that help you do more work at lower cost even under toughest conditions! And it's another ahead-of-the-field design feature found only in the four new Allis-Chalmers tractors.

These Big Benefits Mean DOLLARS to you!

DAILY GREASING PERIODS ELIMINATED. You save at least 30 minutes every day . . . gain about one full month's production every year.

FULL PROTECTION ASSURED. Positive Seals keep grease in . . . dirt and moisture out.

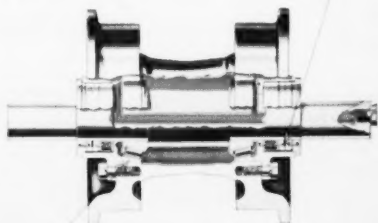
1000-Hour Lubrication gives you protection unchallenged in the tractor field.

SAVES ON GREASE. Truck wheels, idlers and support rollers are grease-filled at the factory . . . need new grease only once every 1000 hours!

EASY TO SERVICE. No more cleaning of dirt, muck and grime from fittings every day. Operator can choose time and place to regrease when conditions are favorable.

Here's the secret:

Positive Seals each have two spring-loaded steel rings — one stationary, the other turning with the wheel. Ground smooth as glass, they seal the grease in . . . keep dirt, grit, dust, mud and water out.



Tapered Roller Bearings protect the Positive Seals by letting truck wheels, idlers and support rollers rotate freely...without side thrust or wobble. Reduced friction lets the tractor move easier, produce more drawbar power.

the newest finest tractor line on Earth!

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DESIGNED FOR YOUR JOBS • BUILT TO TAKE IT • EASY TO OPERATE • EASY TO SERVICE



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Power efficiency went up and operating costs down after a "Cat" D375 Diesel Engine was installed in this P & H 3 1/2 yd. dragline by Cleveland Brothers for the Nanticoke Excavating Company.



Repowered with a 335 h.p. "Caterpillar" D375 Diesel Engine by Cleveland Brothers, this P & H Dragline is providing more and smoother power for its owners, the Helm Coal Co., York, Pa. in their operation at Saxton, Pa.

SOME OF THE EQUIPMENT RECENTLY

Re-powered

with "CATERPILLAR"

DIESEL ENGINES

by Cleveland Brothers

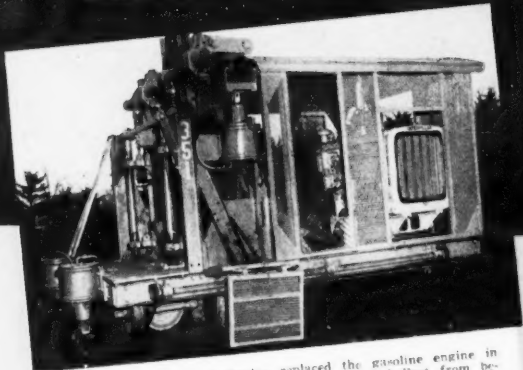
custom tailored to individual needs

There's only one way to lick a tough power job. That's with a tough engine. Specify "Cat" for your machinery and you've got the answer. These big, smooth-running engines have what it takes to handle rugged work with a minimum of down time for repairs. They're easy to start, simple as A.B.C. to operate and economical to run.

It pays to standardize on "Cat" power. You not only get the plus of dependable "Caterpillar" performance—you also get the plus that results from operating equipment built and backed by "Caterpillar" and serviced by Cleveland Brothers Equipment Company. Call or write us today for more information.

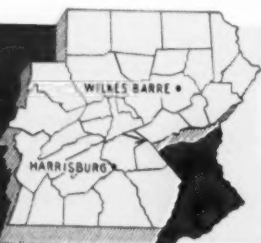


Faced with a power problem, the Sullivan Trail Coal Co. called in the Cleveland experts. A "Cat" D375 Diesel Engine was recommended and installed in this Bucyrus-Erie 5W Walker with a 6 yd. dragline bucket.



A D315 "Cat" Diesel Engine replaced the gasoline engine in this Cribbing machine. It is used to remove ballast from between the ties by the Erie R. R. and it now works two shifts daily with greater efficiency.

The Best in
Equipment and
Service in 32
Counties in
Pennsylvania



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COAL MINING

Vol. XXIX April, 1952 No. 4

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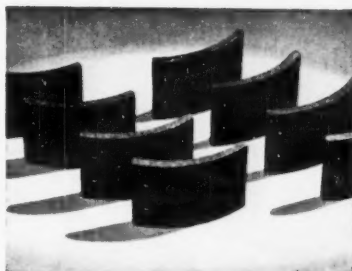


Lubrication engineering follows an established, definite pattern of studying the problem and recommending a lubricant to meet the problem. Do not be misled by unfounded claims on lubrication. Our engineer will gladly study your lubrication problem and recommend the proper lubricant with no obligation to you.

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MARION 362—As a coal loader, the MARION 362 is equipped with a $1\frac{1}{2}$ cu. yd. dipper, a 28'-0" boom and 21'-8" handle. As a stripping shovel, the 362 carries a $1\frac{1}{4}$ cu. yd. dipper on a 28' boom and 21'-8" handle. Dragline boom lengths from 50' to 70'.

MARION 93-M—As a coal loader, the MARION 93-M carries a $3\frac{1}{2}$ cu. yd. dipper, a 34'-0" boom and a 25'-4" handle. As a stripping shovel, the 93-M is equipped with a 2 cu. yd. dipper, a 34' boom and a 27'-6" handle. Dragline boom lengths from 60' to 80'.

If your coal loading or stripping operations call for a shovel or dragline in the $\frac{3}{4}$ to $3\frac{1}{2}$ cu. yd. size range, be sure to get the complete story on these four MARION machines. Contact your nearest MARION distributor or District office or write to the factory at Marion, Ohio.

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to 45 cu. yds.

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Multi-purpose—for all types of heavy duty transmissions and final drives—Meets U. S. Army Spec. 2-105B.

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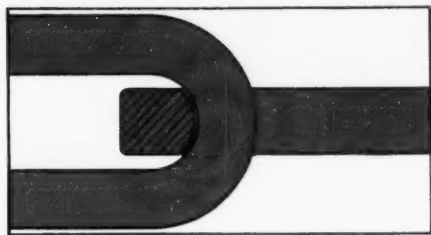
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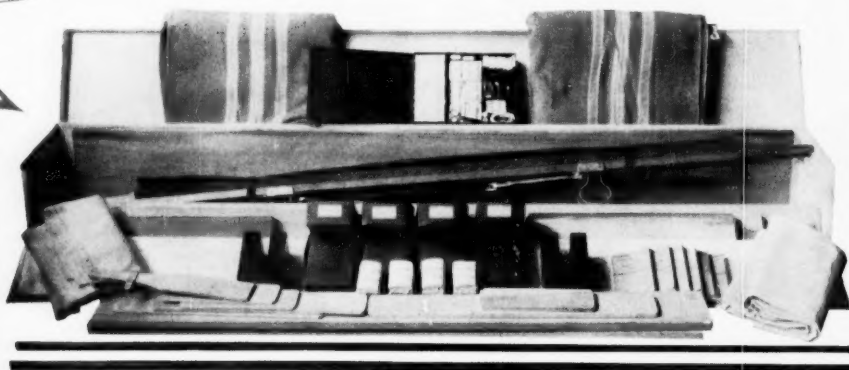


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Our job is to help you.

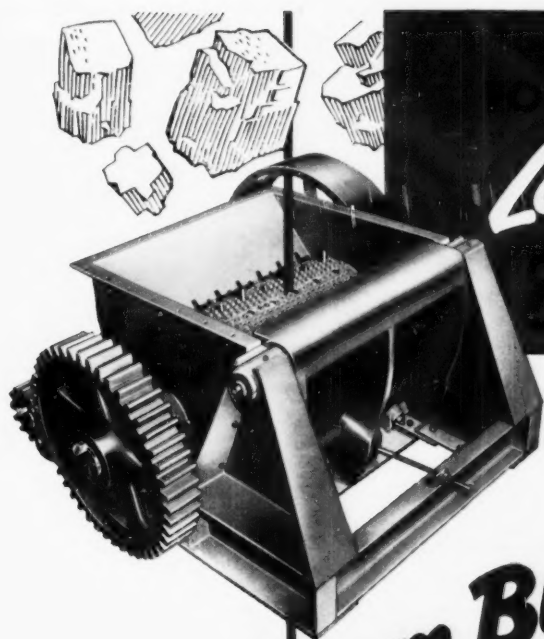
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BITUMINOUS COAL INSTITUTE

A Department of National Coal Association, Washington, D. C.

FOR ECONOMY  AND DEPENDABILITY

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• "Shock" does not mean the same to everyone, not even doctors. Two British physicians, Drs. R. T. Grant and E. B. Reeve, criticize the common and loose employment of the word shock to describe the condition of disaster casualties. This may even cost human life.

The so-called condition of shock, they say, is "ill-defined." There is no assurance "that cases grouped by one man as shock or no shock or in a particular degree of shock will correspond at all closely in underlying causative factors, or even in symptoms or signs, with those so grouped by another."

As commonly used, shock may at one time apply to a person who is suffering from great loss of blood and at another to one who is suffering from pain, fright, cold or infection. The result may be a disastrous delay in starting proper treatment.

Based on a study made by teams of British doctors on over 300 severely injured people, most of them air raid and war casualties, the report concludes that in most cases of abdominal injury or of severe injury of the limbs the chief, and often unrecognized, condition requiring urgent treatment is a drastic loss of blood. The high death rate among patients with very large limb injuries was mainly due "to failure to recognize the grossness of the hemorrhage and to give sufficient blood by vein sufficiently early and quickly."

"In such cases the hemorrhage is of the order of 50 per cent or more of the total blood; these patients urgently require very large transfusions and respond well to them."

Any patient with a very large wound usually requires a very large transfusion, "much more than even a bold transfusion officer is inclined to give till he has learned for himself."

In their experience the doctors found that it was "bad practice to delay transfusion." If life is to be saved, then transfusion must begin at once in any casualty showing "a marked degree of circulatory failure." Signs of these are: blood pressure below 70, rapid heart rate, marked pallor, cold extremities, and often restlessness and difficult breathing.

On the basis of their very careful and extensive observations the doctors have been able to reclassify the post-injury conditions formerly loosely lumped together under the term shock and arrange them in a series of recognizable patterns which "makes diagnosis more precise and guides treatment better than the use of the prevailing idea of shock."

Working from the normal circulatory pattern of "normal blood pressure, a normal pulse rate, warm extremities and a good face color," the doctors have defined a half dozen disturbed variations of this normal pattern, giving each a characteristic name and describing the type and degree of injury with which each is usually associated.

The study on which the report is based is unique in that the patients were "followed in detail from the time of admission to hospital until recovery seemed assured or until death. With few exceptions, the recorded observations of others have been almost confined to the initial state of the patient and its (immediate) response to treatment."

The report, which contains much invaluable material on the condition and handling of injured people, comes from the British Medical Research Council and is called "Observations on the General Effects of Injury in Man."

Here and There in the Coal Industry

• Election of Maurice D. Cooper, Director of Mining Engineering Education, National Coal Association as chairman of the Mining Standardization Correlating Committee of the American Standards Association was announced here today. For many years, Mr. Cooper has taken a leading part in the development of safety standards for conditions and equipment in coal and metal mines. He was previously vice-chairman of the committee.

The Mining Standardization Correlating Committee is the top technical group in charge of voluntary national standards for the mining industry.



Maurice D. Cooper

During his career Mr. Cooper has worked for the Ellsworth Collieries Co., Ford Collieries Co., and Hillman Coal and Coke Co. in engineering capacities.

H. H. Otto, Hudson Coal Co., Scranton, Pa., has been elected vice-chairman of the MSCC.

• At the Twenty-second Annual Meeting of the Illinois Coal Operators Association held in Chicago on December 18, the following were reelected as members of the Executive Board until the next Annual Meeting, or until their successors are duly elected: Executive Board—D. W. Buchanan, George B. Harrington, F. F. Kolbe, T. C. Mullins, Stuyvesant Peabody, Jr., A. H. Truax, William P. Young, Treasurer—C. W. Peterson.

Immediately following the close of the meeting the Executive Board

met and reelected the following officers and general counsel for the ensuing year: President—H. A. Treadwell; Secretary—Fred S. Wilkey, and General Counsel—Thurlo G. Essington.

• Pittsburgh Consolidation Coal Company today announced the completion of two transactions involving the lease and sale of coal mines and reserves in the Freeport field, northeast of Pittsburgh.

One transaction involves the lease to Republic Steel Corporation of Renton Number 6 Mine, located at Newfield, and approximately 3,000 acres of metallurgical coal. In operating Renton 6 Mine, Republic will coordinate the raw coal facilities at the mine with its own recently rebuilt coal preparation plant at Russellton, thereby providing itself with a high quality coal for use in steel making.

In the other transaction, National Steel Corporation and Pittsburgh Consolidation Coal have combined certain acreages in the Freeport field and jointly leased approximately 6,000 acres to a newly formed corporation, Renton Coal Co. This new company, owned 60% by Pittsburgh Consolidation Coal and 40% by National Steel, has acquired Renton Number 3 Mine, with its plants and equipment, from Pittsburgh Consolidation Coal. The facilities of Renton 3 Mine, which is located at Renton, will be used to mine the jointly leased acreage.

These transactions, it was reported, will permit a more orderly and efficient mining of reserves in the Freeport field and assure a use in keeping with the quality of the coal. Representing additional steps in the coal company's announced intention of making long-term arrangements with its major customers, the actions will meet the increased coal requirements of these growing steel companies with a minimum of new capital investment required.

Officers of the new Renton Coal Company, whose main office will be located at Library, Pa., will be: G. A. Shoemaker, president; G. W. Kratz, vice president and secretary; and H. K. Yontz, treasurer.

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Stripping shovel in pit at the Harbaugh & Kimmel pit near West Newton, Fayette County, Pennsylvania.

Stripping Coal in Fayette County, Pennsylvania

Coal stripping in Fayette County, Pennsylvania, is, with a few exceptions, done in the Pittsburgh and Redstone seams. The Pittsburgh seam, in this county, being in the Famous Connellsville Coking Coal Region, is the lowest of the stripable coals and is by far the most important. Lying in a rolling position throughout the county, the Pittsburgh seam is present at various heights. The Pittsburgh coal has been pretty much exhausted

and what is now being stripped is crop coal on old worked out property that could not be taken in deep mining because the roof could not be held or coal left in isolated spots that had to be abandoned in deep mining for one reason or another. The crop coal in the Pittsburgh seam varies in quality. Some of it is good enough for beehive oven coke use for metallurgical coke and some is used for steam generation. Where the Pittsburgh

coal can be stripped, it is virtually black gold, for cover is generally not high and can be moved with tractor or with shovel without shooting, and runs from 7 to 10½ feet in thickness. In ninety-nine percent of the operations only one highlift shovel cut can be made to the old underground workings.

Crop stripping in the Pittsburgh seam has been going on for some years now and there is no end in sight. The amount of this kind of stripping seems to be governed by how much of it is let by the large captive coal owners. Because stripping in the Pittsburgh seam can be done only in the outcrop of deep mined area where the coal lies high and part of the seam has been eroded, large scale operations are not possible. A shovel having 45 foot boom and 36 foot dipper stick are often too much equipment. In fact a goodly portion of this crop coal can be uncovered with only a tractor. That is when you are mining black gold.

The other two stripable seams of coal in Fayette County are the Redstone and the Sewickley seams. The Redstone seam lies between the Pittsburgh and Sewickley seams and is pretty generally present where the Pittsburgh seam is present. The Sewickley seam has been found and stripped in the extreme southern part of the county but at present does not seem to be of any importance in stripping.



Caterpillar D-8 tractor assisting stripping shovel at the Harbaugh & Kimmel Company.



Stripping shovel in pit at the Smithton operation of the Servanti Coal Company, in the Redstone seam.



Osgood-General shovel loading out coal at the Smithton operation of the Servanti Coal Co.



Top: Lima Model 104 shovel loading out the Redstone seam coal at Harbaugh & Kimmel operation.



Left: Jaeger air compressor in pit at the Harbaugh & Kimmel operation.

Right: Lima Model 604 shovel stripping rock overburden in the Redstone seam of coal at the Swaney & Moats operation near Fairchance.





Lima Model 1201 shovel stripping overburden at the Waltersburg operation of the Servanti Coal Company in the Pittsburgh seam.

The Redstone coal runs about four feet in thickness and as a rule is steam coal. The seam contains considerable clay veins which give plenty of headaches in loading out the coal. Some of the strippers in the extreme southern part of the county say the Redstone coal runs less than one percent in sulphur and, blended with Pittsburgh seam coal, makes a good metallurgical coke.

Generally cover on the Redstone coal is a hard blue shale directly on the coal. This shale turns to a softer brown shale then to a yellow shale as the cover nears the surface. In

most instances this kind of cover is stripped without shooting. In other instances a layer of either sandstone or limerock is present and when this rock gets thick some shooting must be done. Still in another instance, like at the Swaney and Moats operation just south of Fairchance, lime rock gets thick and lots of shooting is required.

At operations where only shale is present on the coal, up to 60 feet of cover is moved with the assistance of tractors on the highwall and tractors behind the stripping shovel.

At the operation of Harbaugh

and Kimmel, which lies at Scott Haven near West Newton, the cover consists of a comparatively soft shale and as much as 12 feet of loam. There stripping is done with a Northwest standard model 80-D shovel having $2\frac{1}{2}$ cubic yard dipper. When cover reaches a high point the top layer of loam is pushed down with a tractor and a tractor is used behind the shovel. The coal is loaded out with a Lima Paymaster shovel.

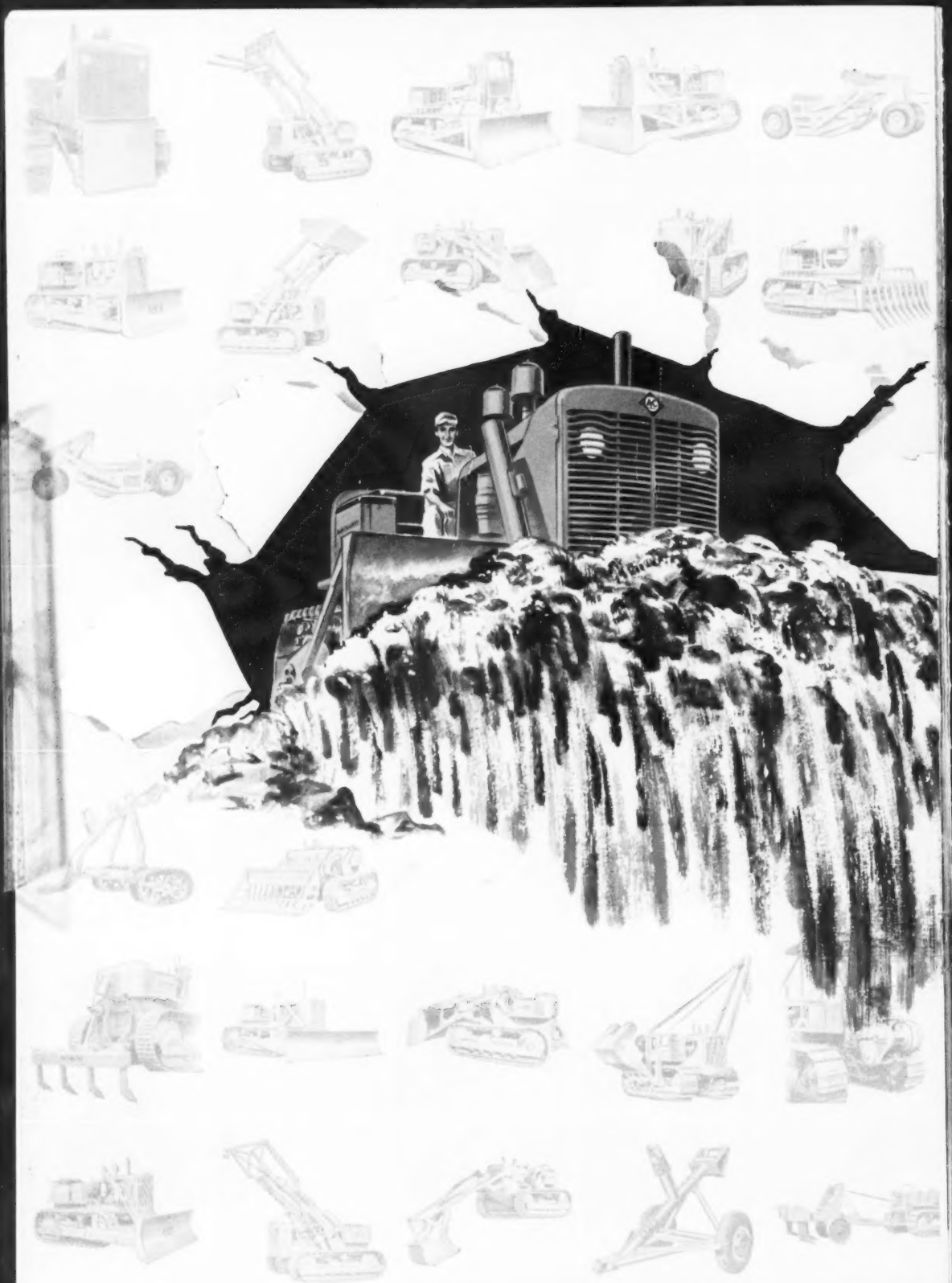
About two miles directly East of Smithton, the Servanti Coal Co. is stripping an isolated deposit of Redstone coal. Cover is hard blue



Caterpillar tractor cleaning the surface of stripped coal at the Waltersburg operation of the Servanti Coal Company.



Loading out the Pittsburgh seam coal at the Waltersburg operation of the Servanti Coal Company.



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The design of this equipment — mounted and drawn — takes full advantage of the balance and outstanding performance capacity of the tractors. Each unit, like the new tractors, is **BUILT TO TAKE IT, EASY TO OPERATE, EASY TO SERVICE**, and *most important*, **DESIGNED FOR TODAY'S JOBS**.

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Each of the new Allis-Chalmers crawlers provides a new yardstick for rating tractors. Each sets new standards for performance, strength, servicing, operation.

HD-5

40.26 drawbar hp.
11,250 lb.

HD-9

72 drawbar hp.
18,800 lb.

HD-15

109 drawbar hp.
27,850 lb.

HD-20

175 net engine hp.
41,000 lb.

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A-4000



Top left: Allis-Chalmers HD-20 tractor moving rock overburden at the Swaney & Moats operations near Fairchance, in the Redstone seam.

Top right: Allis-Chalmers HD-20 tractor cleaning coal at the SB & S Coal Company, near Fairchance, in the Pittsburgh seam.

Allis-Chalmers HD-20 tractor pushing overburden off the Pittsburgh seam coal at the operation of the SB & S Coal Company, near Fairchance.



Loraine Model 820 shovel loading out Pittsburgh seam coal at the SB & S Coal Company near Fairchance. This shovel does the stripping when it is not loading coal.



The Lima Model 805 stripping overburden off the acre of Pittsburgh seam coal near Smithton.

shale that turns brown and yellow to loam and is moved without shooting. A tractor pushes the top layer of the cover when high cover is reached. Stripping is done with a Manitowac model 3500 shovel having $2\frac{1}{2}$ cubic yard dipper.

South of Uniontown, near Fairchance, in the opposite end of the county, Swaney & Moats is stripping considerable limerock on the Redstone coal. Shot holes are made in the overburden directly under the limerock with a horizontal drill. A Jaeger air compressor is also used to make shot holes in the rock overburden. An Allis-Chalmers H D 20 tractor pushes top soil and shot rock from the highwall. Stripping is done with a Lima 805 shovel. Up to 35 feet of overburden is moved.

Farther south is the operation of the S B & S Coal company which is stripping the Redstone and the Pittsburgh seams on the same property. Cover on the Redstone coal is shale which is moved, without shooting, by an Osgood model 1006 shovel, assisted by a Caterpillar tractor. The Pittsburgh seam on this property has been deep mined and the one cut in the crop line is uncovered with Allis-Chalmers H D-20 tractors and a Lorain model 80 shovel with $1\frac{1}{2}$ cubic yard dipper which also loads out the coal.

At Waltersburg, about 7 miles West of Uniontown, the Servanti Coal Company is stripping crop coal in the Pittsburgh seam. The coal runs from 1 to $10\frac{1}{2}$ feet in

thickness. Only one cut can be made. Cover runs from 4 feet to 35 feet high. Stripping is done with tractor only in the low cover spots and with a Lima model 1201 shovel, assisted by a Caterpillar D-7 tractor on the highwall in the higher areas. The tractor is also used to clean the surface of the stripped coal. Loading was being done with a Michigan shovel having $\frac{1}{2}$ cubic yard dipper. At times the Lima shovel is put into the pit for loading.

At Smithton, L. W. Overly ran a Lima model 805 shovel about a quarter of a mile over old strip spoil banks to get a $\frac{3}{4}$ acre piece of the Pittsburgh seam coal. A Caterpillar D-7 tractor was the only other piece of equipment on the job.

- Electrical workers servicing apparatus dealing with high voltages will be able to tell if circuits with which they are working contain dangerous currents by means of a simple, improved detector which brought patent 2,575,680 to an English scientist, Herbert Stanley Petch, Edgeware, England. Rights are assigned to Elliot Brothers Limited, of London.

His device consists of a small windowed chamber which contains two liquids that ordinarily can not mix together. It has a pair of electrodes so placed that the production of an electric potential difference between them will cause a visible change in the distribution of the fluid within the chamber. When held near a wire, the device gives

instant information whether it is a live line or not.

- Insulating tape for electrical uses, containing mica flakes, remains permanently flexible with a binder of a specially heat-treated pine tar. It withstands stresses more effectively than rigid tape and is not subject to the cracking, curling and shrinkage of the rigid type.

Inventors are Earl L. Schulman, Swissvale, Pa., and George S. Reeder, Washington, D. C. Patent 2,575,733 was their award. Rights have been assigned to Westinghouse Electric Corporation, East Pittsburgh, Pa. The pine tar used is maintained at a temperature of about 225 degrees Centigrade for

from three to eight hours. This drives out the oils and other volatile matters that pine tar ordinarily contains.

- A new, comprehensive Bulletin, No. 1151, covering Eagle Coal Reduction Equipment, is just off the press. It describes Eagle Double Roll Coal Crackers and Stoker Coal Chippers, for small mines, power plants and coal yards. Auxiliary equipment described includes stationary "Packaged" units with integral motor mount, flared hoppers for conveyor set-ups and wheel mounting for portability of chippers and crackers. Bulletin sent on request. Address Eagle Iron Works, 129 Holcomb Ave., Des Moines, Iowa.



The Marion Model 93-M Shovel loading out coal.

One Shovel Strips and Loads Coal at Pipo Brothers Operation

The Pipo Brothers from Steubenville, Ohio, are using a Marion Model 93-M shovel with Esco 2 cubic yard dipper for stripping overburden two shifts and loading out coal one shift each day.

Their operation lies in the hills

above the Ohio river about four miles South of Steubenville. They move up to 60 feet of draw slate on the coal, blue and yellow shale and top soil. When the cover gets high they use a Caterpillar D-8 tractor to push off up to 15 feet of the top cover.

The surface of stripped coal is cleaned and roads are maintained with one of the Caterpillar D-8 tractors. Pumping is done with a Jaeger pump. All the output is trucked to the Tidd Power Plant at Brilliant, Ohio, about three miles from the operation.



One of the Caterpillar D-8 Tractors cleaning the surface of stripped coal.



The 2-inch Jaeger pump pumping water from the pit.



Model 1201 Lima Dragline working at Robert Bailey Operation near Grasflat

During World War II, coal stripping in Clearfield County, Pennsylvania, contributed materially to the war effort. Because the coal land in that county is individually owned and must be bought separately, with each owner trying to up the price of his land, large operations are not possible, not until some way is devised to have the individual owner pool his land and accept his proportionate share of the sale price.

The seams of coal stripped most in Clearfield County are the "B" and "C" seams. The "A" seam which is the deepest of the seams that are strippable, supplies the smallest tonnage.

Clearfield County, Pennsylvania Maintains Important Place in Coal Stripping



Caterpillar D-8 tractor pushing highwall ahead of the Lima dragline at the Grasflat operation of Robert Bailey.



Drilling rock overburden at the Grasflat operation of Robert Bailey.



Two stripping units and tractor moving overburden at Robert Bailey operation.

During World War II and shortly after, tonnage produced by stripping was somewhat greater than at present, but considering market conditions Clearfield County is doing well.

The largest producer of stripped coal in the county at present is Robert Bailey with headquarters at Morrisdale, near Philipsburg. Robert Bailey has several operations but his largest lies about 6 miles southeast of the old deep coal

mining community of Grasflat. There he is stripping with a number of draglines, the largest being the Lima Model 2400 which is one of the largest stripping units on Caterpillar treads. This dragline has an 80 foot boom and 7 cubic yard Hendrix bucket. Other equipment consists of a Salem Tool Company horizontal earth drill for making shot holes in the overburden, Allis-Chalmers HD-19 and HD-20 tractors, Caterpillar D-8 tractors, Rock drills

and air compressors, and a Caterpillar Model 12 Motor Grader which is used mostly in the maintenance of the roads.

The River Hill Coal Company is probably the second largest producer of strip coal in Clearfield County at the present time and one of the most progressive. This company has two operations near Keewaydin and one at Kato, near Clarence. The operating office and shop are at Kylertown. The River Hill Coal



Lorain Model 820 shovel stripping overburden at Robert Bailey operation.



Caterpillar Model 12 Motor Grader maintaining road at Robert Bailey operation.



Lima Model 1201 shovel at Keewaydin operation of River Hill Coal Co.

Company is operating three Lima Model 1201 shovels, two Manitowac shovels for stripping and one Lima Paymaster and one Wayne Crane for loading out the coal. Two Salem Tool Company earth drills are used for shot hole drilling. Three Allis-Chalmers tractors push down high-

wall and do other work around the pits. Five gasoline driven pumps of various makes are also distributed among the pits.

Overburden on the coal in Clearfield County runs pretty much the same, consisting of blue shale down on the coal, turning to yellow shale,

then to top soil. With the larger equipment, Robert Bailey takes up to 65 feet of cover with tractors pushing highwall. At the River Hill operations up to 55 feet is taken with tractors pushing down highwall and two casting with the strip shovels.



Allis-Chalmers D-20 tractor cleaning coal at Keewaydin operation of River Hill Coal Co.



Allis-Chalmers D-20 tractor pushing highwall at Keewaydin operation of River Hill Coal Co.



Allis-Chalmers road grader cleaning coal at the River Hill Coal Co.



Lima Paymaster loading out coal at the River Hill Coal Co.



View from down in the pit at the Colitz Coal Co.



Two 50 cubic yard Tournarockers in coal hauling service at the Colitz Coal Co.

Tournarockers in Anthracite Stripping

A hundred years ago materials used by man were obtained mainly from natural resources of plants, animals and minerals. Today the chemist determines the atomic patterns in nature's substances and assembles atoms to his own design, thus creating new, better and cheaper materials that can be compounded to best suit man's needs.

At the moment man's synthetic future calls for happy, healthful and kittenish people at the age of 100 years. It calls for clothing made from coal and oil. It calls for the cure of human ailment by a variety of drugs and medicines; for storage of the sun's energy for man's use, for pears and apples and oranges as big as grapefruit; for fish ranches in fenced-off water, rivaling cattle ranches and for the deliberate molding of people mentally and physically by drugs.

Already 99% of our dyes are

synthetically made and drugs and medicinals run 75%. Natural gums and resins account for only 5% of the 2.3 billion pounds of plastics produced in the United States last year.

Ore, like titanium from the earth, like magnesium, bromine, salts and new elements from the earth and from the sea will be extracted commercially in the near future and will be used as alloys in new, strong metals for continuous mining machines underground and for much stronger and larger earth moving equipment on the surface.

In the coal producing industry we are not so much concerned about splitting the atom or about extracting old or new elements from the earth or the sea as we are in the application of those new elements to make stronger materials that will help in winning coal from the earth.

When we look at the 50 cubic

yard Marion Power Shovel and the LeTourneau 50 yard Tournarocker in the coal stripping industry, we see that our industry is not far behind in the application of new thought and new materials. As long as we have geniuses in earth moving like R. G. LeTourneau and men in the coal industry like John Colitz of the Colitz Coal Company, we will never be far behind in applications of new things.

The Colitz Coal Company is stripping the Mammoth seam of anthracite coal at New Philadelphia, Pa., about 15 miles east of Pottsville. Like in most cases in that region the coal has been deep mined but this particular property is now privately owned. The seam has been folded over in the great upheaval of the earth that formed the Appalachian mountains and it lies between tough rock. This rock is drilled and shot and moved with draglines and large rock hauling



50 cubic yard Tournarocker pulling load of coal up steep grade at the Colitz Coal Co.



Tournarocker dumping load of coal at the Colitz Coal Co.



Truck being loaded with coal for haul to cleaning plant at the Colitz Coal Co.



New repair shop at the Colitz Coal Co.



Two views showing loading 18 cubic yard Tournarocker at the Steiner operation.

units. Since the coal is followed down for several hundred feet most of the rock cover is hauled from the pits.

When the LeTourneau E-50 Tournarocker was placed on the market, John Colitz installed 3 units for hauling rock and coal. The units have a maximum capacity of 50 tons. Their turning angle is 90 degrees, right or left. Tires are (30:00 x 33:40). Length is 13 feet, 10 inches. The engine is Allison Butane gas or combination of both and is rated at 450 hp. Drive is Tournamatic Constant

Mesh with Single Type Positive Power Steering. Maximum speed is 34 MPH. Lubrication is through 8 Alemite fittings.

These units have been in service long enough to indicate their worth and to use Mr. John Colitz's own words "we lubricate the unit while it is being refueled, saving at least 4 hours of two mens time. "Pulling power, speed and all other features of the units have been very satisfactory to date.

J. Robert Bailey, who has become the largest coal stripper in the hard coal region, is using 4 Le-

Tourneau E-18 Tournarocker at his Centrailla operation. The Steiner Stripping Company at Mt. Carmel also has 3 units of the E-18 Model "rocker". These units have a maximum capacity of 18 tons and a maximum turning angle of 90 degrees, right or left. Their length is 16 feet 3 inches. Their width is 10 feet 3½ inches. Height is 11 feet 2½ inches. Engine is Cummins, 186 hp. Diesel fuel. Drive is Fuller transmission. Positive Power Steering. Tires are (21:00 x 25:24). Maximum speed is 32 MPH.



Eighteen yard Tournarocker enroute with load at Steiner operation.



Dumping load at the Steiner operation.

Annual Dinner Meeting of Pennsylvania Open Pit Mining Association

The Annual meeting of the Central Pennsylvania Open Pit Mining Association was held at Philipsburg, Pennsylvania, on February 11. Following are the remarks made by the president of the association.

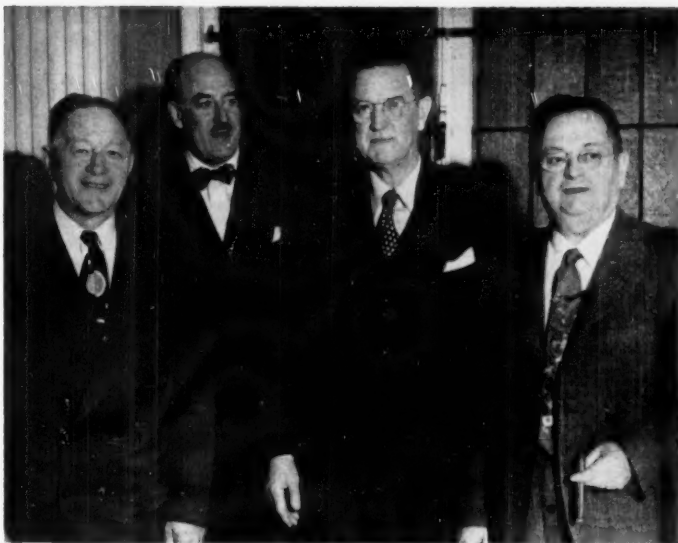
As President of this Association it is my happy privilege to welcome you to our Annual Dinner Meeting. And, it is my duty to make a report to our membership. A report of our Association is, in fact, a report of our industry which, because of its place in community economics, is of equal importance to everybody here.

Our Association is in its sixth year and since its organization it has continually grown in strength, numerically, and influence for the promotion and protection of the industry. The Association now numbers 71 "A" members who are either operators or stripping contractors for operators, and 39 "B" members who are suppliers of services, equipment and goods to the industry and are equally interested with us in the stability of the industry.

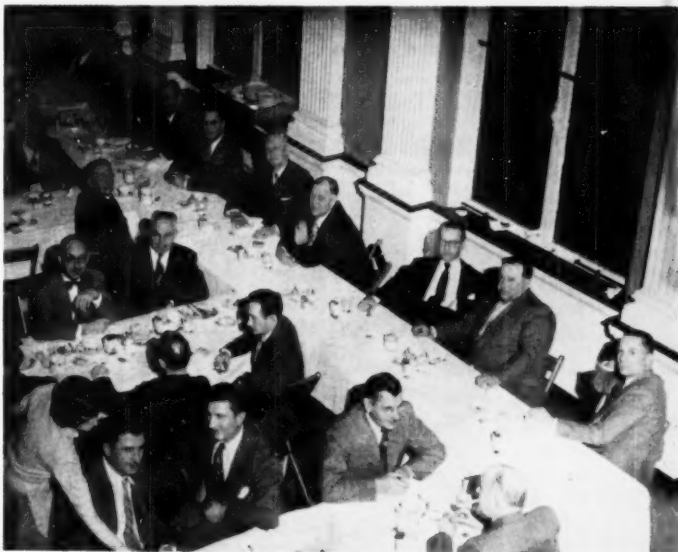
While the bulk of our membership is naturally in Centre and Clearfield Counties, we number operators and contractors from Jefferson, Clarion, Blair, Somerset, Cambria and Clinton Counties among our membership.

An indication of the interest our members have in the Association is the fact that of the total membership of 110,107 are paid up in good standing, a record, we believe, for industry associations. We have able Counsel, an efficient executive looking after details, legislation and public relations, and a board of Directors who really work at their job.

All through these six years it has not once been necessary to postpone business because of a lack of a quorum, and, our membership has taken a keen interest in our objec-



Left to right: Alex Bailey, Director of CPOPMA; Millard Bennett, speaker; J. H. Williams, President and G. Albert Stewart, Executive Secretary.



Speakers' Table, left to right: Alex Bailey of B. & B. Construction Co.; a director who introduced Millard Bennett of New York; the speaker, Millard Bennett; J. H. Wallin, OPMA President; G. Albert Stewart, Executive Secretary; Judge F. Cortez Bell; Senator A. H. Letzler; Robert T. Laing of Central Producers; Ray S. Walker, Bigler, Pa.; Herman S. Moore, Philipsburg; and Frank A. Whitsett, Counsel.



tives, as indicated by the attendance here tonight.

Through the bulletins issued at frequent intervals our membership is kept well-informed on all those matters affecting their interest. It is not necessary, then to bore you with the details of all that has happened during the past year, and it has been a busy year, indeed.

Our industry was terribly handicapped during December and January by bad weather conditions but from the production standpoint fared quite well in 1951. Of the total bituminous output of 104 mil-

lion tons in Pennsylvania in 1951, strip mining accounted for over 20 million tons, approximately the same as for the previous year.

Price-wise, the industry fared no better, and no worse than did the deep mine industry, both suffering from over-production. The main consideration is that strip mining held its own and it may be predicted that it will continue to do so.

True, the industry suffered some annoyance late last summer and early fall; indeed, it faced a threat to its very existence, but cool heads, calm judgments, and a supporting

public opinion triumphed, and the industry went unscathed. To some extent the same threat exists today, and probably always will, and those in the industry must continue to be on the alert, but the workers in the industry—the men in the pits, and on the equipment and driving the trucks—continue to be adamant in their resolve to remain independent American workers. The industry will survive because it treats its workers well. Your officers take the Association membership into their confidence, acquainting the membership at all times

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with what they are doing. Financial reports are issued giving the status of Association funds. Suffice it to say that, although operations were costly in 1951, due to protective activity when the industry was under assault, Association finances have not been impaired and the Association continues to be in a position to afford protection to the industry and to the men working in the industry.

Everybody engaged in the industry is now committed, by law, to the obligation of reclaiming surface as soon as possible after it has been disturbed. Moreover, everybody is contributing, under law, to the creation of a State Reclamation fund, the moneys of which are used to reforest old spoils piles created years ago.

This work is going on rapidly. Last year, according to the De-

partment of Forests and Water, 4,248 acres were reclaimed by operators and 854 acres of old spoils were re-forested by the State, using money provided by present day operators. 731 acres of the total reclaimed by operators was restored to agriculture. The program for this spring calls for 475 acres of old spoils to be re-forested in this immediate area within the boundaries of the Moshannon State Forest District. We shall soon have young forests growing where, in many instances, nothing grew before.

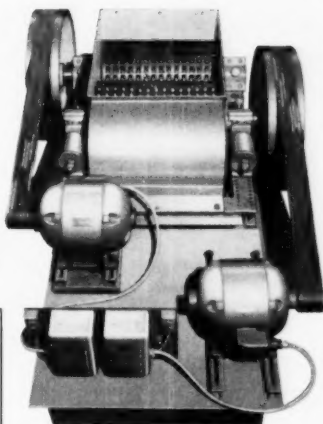
On behalf of all the officers and directors, I wish to thank every member for this continued cooperation and support and we wish also to express our gratification at the response of the public to our plea that the problems of the industry be understood.

Less POWER CONSUMPTION

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SCOTSDALE double-roll COAL CRUSHERS

NO. 63 SPECIAL — 2 MOTOR DRIVE—PRODUCES A PRODUCT $\frac{3}{4}$ " to 8". EQUIPPED WITH TWO GROOVED FLYWHEELS (NO GEARS)



Through an efficient shredding action by toothed double rolls, assembled in a staggered position, Scottsdale crushers use LESS power than conventional-type crushers. A more uniform and consistent coal product is produced . . . fines are kept to a minimum. Other features are: Forged Steel toothed gears; welded steel base; bronze bushed journal bearings; welded steel hopper; grooved flywheels.

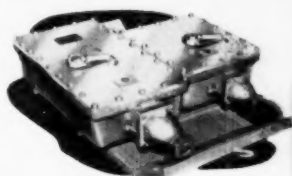
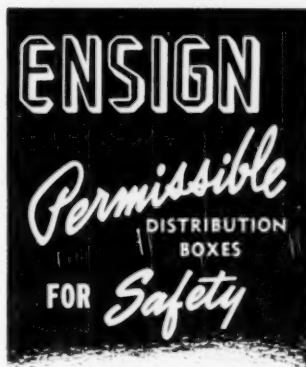
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BOX 51

SCOTSDALE, PA.



Photograph illustrates a two-circuit KG Permissible Box which would be suitable for installation with cutting machines and drills. Boxes are approved for 250 and 550 volts D. C.—220 and 440 volts A. C.

ELIMINATE CABLE FIRES AND MODERNIZE YOUR POWER DISTRIBUTION

● Ensign Distribution Boxes incorporate many exclusive electrical features designed to give safety and protection to your electrical system. Among these is Ensign's exclusive Safety Plug which permits disengaging under load. All parts are renewable.

● Boxes incorporate three-pole De-Ion circuit breakers with shunt trip attachments for tripping breaker, plus ground current limiting device built into breaker.

● Any combination of circuits may be provided. Failure of power supply does not trip breaker when shunt trip attachment is used—saving many man hours. No circuit is broken outside the enclosure.

SCHROEDER BROTHERS

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EXPRESS 1-1571



• The "Cat" Care Program, to increase the profitable use of "Caterpillar" equipment, is being explained and illustrated directly to "Caterpillar" owners and operators by Cleveland Brothers Equipment Co. These educational meetings are being conducted by Ed Ryder, General Parts and Service Manager, in practically every county in Central and North Eastern Pennsylvania. A movie, "Down

Time" is first on these programs and stresses the fact that 10 or 15 minutes of daily care will give thousands of hours of additional life to tractors. John Greenlee, Service Manager, at the Wilkes-Barre Branch of Cleveland Brothers, explains the Preventative and Protective maintenance on Caterpillar Tractors. Another film "Short Cuts" illustrates the uses of "Cat" Specialized Tools.

Next is a discussion on Cleveland Brothers Parts Conservation Program, conducted by Al Wolfe, Harrisburg Service Manager, with emphasis on the new track-link welder and the automatic roller and idler welder that have been so successful in conserving steel.

A period for questions has proved very valuable and the interest in the meetings has been very gratifying to the Cleveland Firm.



An even dozen mail sacks carrying coal literature for the teachers of the nation—just one day's output—are shown leaving the mailroom of BCI's Educational Section. During the week ended February 23, individual requests totaling 2,686 were filled, with none being handled on Washington's Birthday or the day following. In the same period, 1,980 new inquiries—all from teachers in grade and high schools—were received by the Bituminous Coal Institute, public relations department of National Coal Association, Washington, D. C. John Hudson, left, and Joseph Gould, BCI mailroom workers, are contemplating their good day's work.

Regional Service Representatives of Cummins Engine Company, Inc., recently attended a three day meeting at Columbus, Indiana. From left to right: Dillard Davis, Central Regional Office, Chicago; Leon O'Neal, Southwestern Regional Office, Los Angeles; Norman Grimes, Southeastern Regional Office, Atlanta; Richard Carlson, Eastern Regional Office, New York City; Ralph Shields, Northwest Regional Office, Seattle; Jack Mitchell, Great Lakes Regional Office, Cleveland; and Arch Herron, Rocky Mountain Regional Office, Denver.



COAL MINING-LOADING MACHINE

Another powered machine for cutting, gouging out and loading underground coal in a single operation, invented by Lawrence L. Wyllam of Welch, W. Va., is claimed to have advantages over other so-called continuous mining machines that have come into use in the past few years. His award was patent 2,533,458.

It contains four separate electric motors to perform its various functions so the speed of each can be regulated by the operator. The machine is mobile and adapted to be moved as desired through the mine by a power means under control of the operator. It has rotary cutters designed to be driven at very high speed. By means of hydraulic devices the cutters can be swung horizontally, and also moved vertically so that coal can be cut or mined at any desired elevation.

● Announcement of Henry Cain as District Sales Representative for Nebraska, Kansas, Missouri and southern Illinois is announced by R. G. LeTourneau, Inc., Peria, Illinois, manufacturer of heavy construction and lifting equipment.



HENRY CAIN

Cain for the past five years has been LeTourneau's Chief Washington Representative at the company's Washington, D. C., office. Before coming to LeTourneau he attended the University of Missouri at Columbia, was with the Sinclair Refining Co. at Kansas City, operated a farm and served five years in military service as supply officer with the Corps of Engineers and an aviation battalion.

● Oil shale and coal will furnish the power of the future, geologists of the nation agree.

The American Geological Institute here in a survey finds that these experts are not confident that atomic energy will find substantial industrial use even by the year 2000. Water power and solar energy



This trio of attorneys — all well known in the coal industry — participated in a special ceremony here this week. Left to right they are: Robert E. Lee Hall, counsel, National Coal Association; James W. Haley, vice president, Jewell Ridge Coal Corporation and Virginia Smokeless Coal Company; and W. Brice O'Brien, assistant NCA counsel. Messrs. Hall and O'Brien on February 4 were admitted to practice before the Supreme Court of the United States after having been presented to the court by Mr. Haley, former secretary and general counsel of the coal association.



Model 27FD special coal body Euclid truck at Ruby Construction Co., Madisonville, Ky. Tailgate and wide body increase load capacity to 15 tons.

will also play a role minor to processed oil shale and coal.

By 1975 direct production of natural petroleum will be past its peak, the geologists agree, and oil imports will be insufficient to meet America's needs. The large oil shale deposits of the Colorado plateau and the low grade coals of the Midwest and plains area will supplement the declining supplies of natural petroleum. Powdered coal will replace industrial fuel oil. Coal pro-

duction should double within 25 to 30 years, with most of this increase used as liquids or gases rather than in solid form.

New light-weight metals, such as titanium, will find extensive use in the future, the geologists believe, because methods will be needed in the near future to explore for new mineral supplies by geological methods, aid construction industries and work on agricultural problems, the Institute predicts.

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length as desired, in extensions of
12 feet. Roller doors, solid panels
available for front; walk door and
window available in end-panel.

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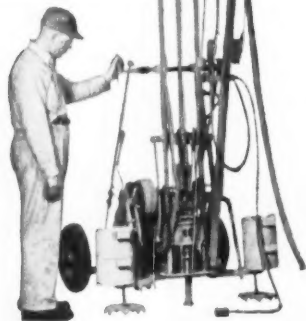
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Pictured above is shown Percy Ross, Minneapolis, Minnesota auctioneer, auctioning one of 500 pieces of construction equipment in Cleveland. Over \$2,000,000 worth of equipment was offered. Buyers from every state in the Union, Mexico, Canada and foreign countries attended. Although the quality and condition of most of the items, which included tractors, cranes, shovels and other allied equipment, were in poor to fair condition, buyers, contractors and dealers eagerly purchased most of the offering.

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• A new 4-page bulletin describing SEAL-KOTE Asphalt and Asbestos Roof Coating is announced by Paramount Industrial Products Company, Inc., Cleveland.

Printed in two colors and illustrated with photographs and line sketches, the new bulletin describes the drying effects of sun and weather on roof coatings and explains how SEAL-KOTE penetrates and seals roofing surfaces and prevents the composition roofing from drying out, cracking and leaking.



According to the bulletin, SEAL-KOTE always remains soft and pliable, and contracts and expands with temperature changes. It is also available in a wet weather grade for use on wet surfaces.

Bulletin L-5201 also describes SEAL-KOTE Plastic Roof Cement for use in repairing cracks, blisters and holes; and SEAL-KOTE Saturant, which is used as a primer coat for excessively dry surfaces.

Write for Bulletin L-5201, Paramount Industrial Products Company, University Center Station, Cleveland 6, Ohio.

• "Moving Mountains to Get Coal" is the title of a booklet by the Swan-Finch Corporation, RCA Building, New York 20, N. Y.

This Booklet illustrates how mountains are moved to get anthracite coal, how a large 25 cubic yard dragline that operates 24 hours a day is lubricated with seven different types of Swan-Finch lubricants under the watchful eye of an oiler whose sole responsibility is to

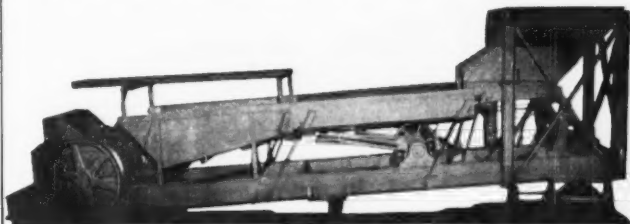
keep the machine properly greased and oiled. It shows how Swan-Finch cam dressing is used on the walking mechanism of the large dragline to make it withstand the terrific pressure on the cams. It shows how Swan-Finch Motul E. P. Gear lubricant is used in enclosed swing gears of draglines and shovels and

how Motul Gun greases are applied to draglines, shovels, tractors and well drilling rigs.

The Booklet states that the Superintendent of Maintenance of one of the big operations claims that "a 50 per cent longer life for parts has been made since Swan-Finch lubricants have been used."

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PORTABLE COAL PREPARATION UNITS



(Patent Pending)

• Comprised of hopper, feeder, screen, picking table and single roll crusher. Capacity—125 or 150 tons per hour. Large heavy-duty Timken double-row roller bearings in the eccentrics and pillow blocks. Over-size Torrington spherical roller bearings in the crusher. The crushers are adjustable from 3/4" to 10" opening. Screened coal over the picking table is diverted by a flap-gate to the crusher or mixed with the slack for mine-run. The screen has a snappy action, resulting in efficient screening.

The picking table has a smooth motion which allows selective picking of the impurities which are disposed of in the trough running over the center of the picking table.

The unit is equipped with magnetic starters and push-button controls, 10 to 15 HP motor on the crusher, 5 HP motor on the screen and picking table. It can be readily transported from one location to another on a standard long-wheelbase truck, with minimum cost for moving and erecting.

When used in conjunction with a belt or chain conveyor, the unit can be adapted to various arrangements for handling the coal from the trucks or mine cars, through the cleaning unit, to the railroad cars or bins.

The use of oversized anti-friction bearings throughout these two unit sizes insures trouble-free operation, with low power and maintenance costs. Full information upon request.

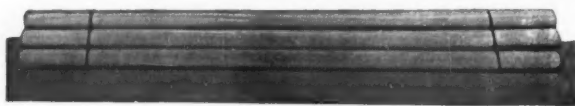
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1" Dia.	8c per lineal ft.
1 1/8" Dia.	12c per lineal ft.
1 1/2" Dia.	14c per lineal ft.
1 3/4" Dia.	16c per lineal ft.
1 7/8" Dia.	18c per lineal ft.
2" Dia.	20c per lineal ft.
2 1/4" Dia.	22c per lineal ft.

Special diameters and lengths can be furnished. These Poles meet the requirements of the New Federal Mine Safety Code

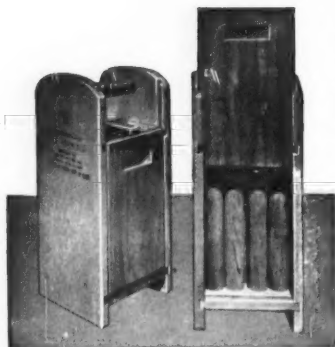


SECTIONAL TAMPING POLES

These Poles are made of straight grained wood and are coupled together with removable wood pin-nut in place in recessed grooves by a rubber band and can be quickly connected and unconnected.

Couplers and Head Blocks are 4, 5, and 6 inches in diameter. Please specify size when ordering. Poles are 1 1/2 inches in diameter.

Head Blocks	4" Dia.	\$1.70 Ea.
Couplers	4" Dia.	3.90 Ea.
Poles	12 ft. long 1 1/2" Dia.	3.60 Ea.
Poles	14 ft. long 1 1/2" Dia.	4.20 Ea.
Poles	16 ft. long 1 1/2" Dia.	4.80 Ea.
Poles	18 ft. long 1 1/2" Dia.	5.40 Ea.
Poles	20 ft. long 1 1/2" Dia.	6.00 Ea.
Poles	22 ft. long 1 1/2" Dia.	6.60 Ea.
Poles	24 ft. long 1 1/2" Dia.	7.20 Ea.



EXPLOSIVE BOXES: Made entirely of wood having no metal parts, tongue grooved and dovetailed construction with automatic lock using a rubber band for a spring, treated with paraffin to make moisture resistant. "Approved by the Pennsylvania Department of Mines." Sizes as listed based on 1 1/4" x 8" sticks.

Powder Box Prices are as follows:

No. 9 Powder Box	\$2.55 Ea.	No. 25 Powder Box	\$5.10 Ea.
No. 12 Powder Box	2.95 Ea.	No. 36 Powder Box	6.50 Ea.
No. 16 Powder Box	3.45 Ea.	No. 50 Powder Box	7.40 Ea.
No. 20 Powder Box	3.90 Ea.	No. 72 Powder Box	8.70 Ea.

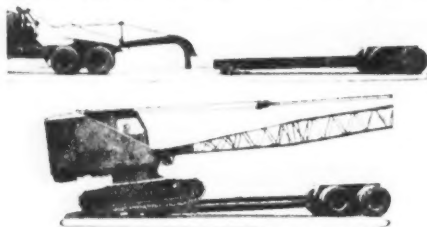
Detonator Box Prices are as follows:

No. 6 size 2 1/2" x 3" x 6" inside	\$2.15 Ea.	No. 8 size 4" x 2 1/2" x 8" inside	\$2.15 Ea.
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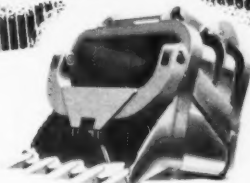
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- ✓ Tough, rolled steel plate body—lighter in weight—greater in strength
- ✓ Cast manganese steel lip with inserted manganese steel tooth points—for greatest resistance to shock and abrasion
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Capacities up to 7 Cu. Yds.

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1	100	Delco	1200
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Model 1006 Air-Controlled Stripping Shovel sets new records in removal of overburden



Good news travels fast. Among strip miners everywhere, word's getting around that the sensational OSGOOD Model 1006 is rewriting the record books for fast removal of overburden. Shovel in above photo is owned by Sanbrac Coal Co., Pittsburgh, and is just one of many Model 1006 machines operating in this major coal producing area.

Model 1006 is specially designed for the coal industry. OSGOOD Air Control with famous OSGOOD Air Cushion Clutch gives unequalled smoothness, accuracy, and speed. A 45-ft. boom and 35-ft. handle provide extra-long reach. Choice of Diesel engines, Buda or Caterpillar. Write for details.



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③ Tournadozer's high-speed mobility puts waiting periods to work

When needed on scattered odd jobs, operator just hops on this big dozer . . . and drives down paved right-of-way or across the pit to his next assignment. One Tournadozer frequently handles clean-up for 3 or more shovels . . . often maintains widely-scattered dump areas, as well. Pushers often do road maintenance during normal waiting periods.

④ drives via highway on job-to-job moves

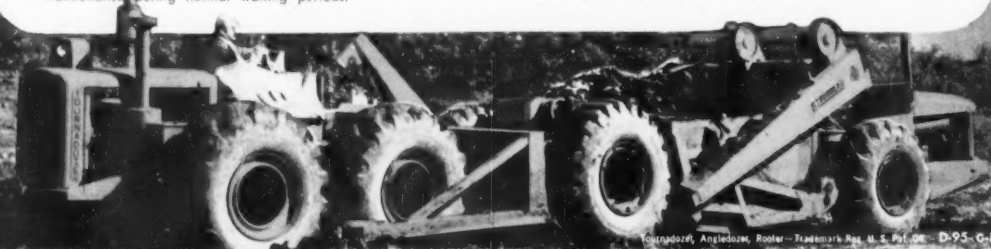
Tournadozer drives cross-country, along tracks, over highways at speeds up to 19 m.p.h. No blocking, no waiting for trailer, no loading or unloading delays. Big tires prevent damage to pavement, curbing, tracks, etc. Multi-disc 4-wheel air brakes and fingertip electric steering control give operator confidence to use top speeds while traveling or when dozing over edge of bank.

⑤ Tournadozer is easy to operate . . . easy on the operator

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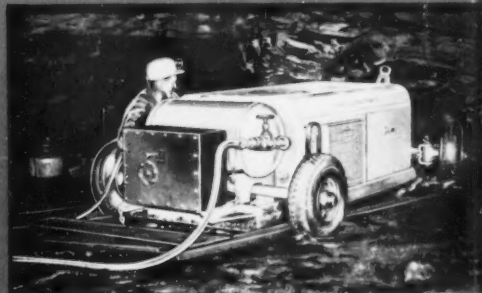


Davey Model 163 at Paul E. Karlin Coal & Construction, Inc. strip mine near Export, Pa.

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